

ATTACHMENT 8A – TRAIL DESIGN STANDARDS

Trail design standards were developed for the following reasons:

- Simplify design and permitting review, especially when private developers are required to build trails or trail connections
- Save time and money for engineering contracts by having a standard set in place
- Ensure that trails are built to safe and environmentally sound standards
- Have consistency within our trail system

The City of Redmond has designated four types of trails:

- Regional Trails
- Connector Trails
- Local Trails
- Blue Trails

Each of the trail types are described below and examples are shown in the photographs to the right.

Regional trails pass through the city, connecting to other jurisdictions and other trails and trail systems. Regional trails such as the Sammamish River Trail are designed to standards for Shared Use Paths as specified in the City of Redmond's Bicycle Facilities Design Manual Guidelines (2009, or latest version). In general, regional trails are physically separated from roads by distance or barriers. At-grade crossings of roadways are minimized to avoid conflicts. These trails should be a minimum of 12 feet wide, with a minimum two-foot wide graded shoulder. Where desirable, paths should have an adjacent four-foot wide unpaved area to accommodate pedestrians. Regional trails are paved; however, interim uses sometimes require the use of soft surface materials such as crushed rock or wood chips.

Connector trails are the key linkages between regional trails and other facilities. These trails can be paved or soft surface trails, and are typically narrower than regional trails, due to more limited use and constraints. Connector trails should meet the City's sidewalk standards and be a minimum width of six feet to ten feet wide. Soft surface materials may be used for interim use.

Local trails are typically soft surface trails that range from two feet to six feet wide. Narrower widths may be allowed for single-track trails. The trails may be used as neighborhood linking trails, park trails, and hiking, off-road



The Sammamish River Trail is a regional trail connecting Redmond to Kirkland and Marymoor Park.



The Ashford Trail is a connector trail that links Hartman Park to Avondale Road.



Local trails in Viewpoint Open space.

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bicycling, and equestrian trails. Local trails are sometimes constructed with the native soil on-site. Vegetation will be cleared and the trail will be graded slightly to reduce off-camber trail conditions, which is an angled slope that can cause difficulty for riders. Some local trails may require reinforcement with gravel, pavers, or bridges in wet or eroding areas.

Blue Trails are water trails along navigable waters within the city such as the Sammamish River and Lake Sammamish. The primary design criteria for blue trails include providing frequent access points to the water where non-motorized personal water craft can be safely and easily transported from parking areas and providing adequate signage and route finding materials.

Exhibit 8A-1: Lakes to Locks Trail System



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8A.1 Trail Surface Materials

The following exhibit lists some of the acceptable trail surface types. However, pervious materials are preferred and new products are encouraged, but would require review by the technical review committee.

Exhibit 8A-2: Trail Surface Materials

Product ¹	Soft Surface	ADA	Functionality	Transportation Fundable	Durability	Permeable
Concrete	No	Yes	B,P,W,S	Yes	25 years	No
Permeable Asphalt	No	Yes	B,P,W,S	Yes	8 years	Yes
Asphalt	No	Yes	B,P,W,S	Yes	10 years	No
Soil	Yes	No	MB,P,E	No	Life with maintenance	Yes
Pavers with fines	No	Yes	B,P,W,S,E	Yes	15 years	Yes
Hog Fuel (wood shavings)	Yes	No	P,E,MB	No	1-3 years	Yes
Gravel	Yes	No	P,W,E,MB	No	2-5 years	No
Filbert Shells	Yes	No	P,W,E,MB	No	7-10 years	Yes
Grass and Gravel filled pavers	Yes	Yes	B,P,W,E	No	up to 25 years	Yes
Crushed fines <3/8"	Yes	Yes	B,P,W,S,E	No	2-5 years	No
Permeable Concrete	No	Yes	B,P,W, sometime skate depending on type	Yes	15 Years	Yes

B = Bicycle,

P = Pedestrian

S = Skate

W = Wheelchair

E = Equestrian

MB = Mountain Bike

¹ Derived from Alta Planning + Design, “What’s Under Foot”, and other product webpages.

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8A.2 Trail Amenities

Trail amenities include items that provide trail users comfort such as benches, signs, garbage receptacles, drinking fountains, bicycle racks, pet stations, equestrian mounting and dismounting stations, and information kiosks. The following are a list of some of the standard City of Redmond amenities. Those that are not listed can be proposed on a project by project basis.

Signs – Three to four individual signs are generally included on trail signage. All are placed on a 6"x6"x6' post of ground-treated lumber. Two feet of the post is set in the ground. The signs are each 9" x 9", brown background with white trim. They include:

- Map and Trail Name with City of Redmond logo
- Mileage to specific destinations
- Directional arrow
- Designated Use (pictures of horse, hike, bike, etc)

Benches – In the park system the standard benches include: Pilot Rock OWRB or SWB/G-6TP (www.pilotrock.com). However, the City supports the construction and installation of “natural” benches out of native materials in these more natural settings.

Trash Receptacles – The City currently uses Pilot Rock TRH-32 trash receptacles, with recycled plastic slats and molded plastic domed lid. Recycle containers are the same product with a different lid configuration.
(http://www.pilotrock.com/trash_recycling/trh_series.htm)

Equestrian Mounts – Treated wood structure consisting of two steps, each approximately 9 inches in height. The top platform is covered in wire mesh to reduce slipping.

Kiosks – There are unique kiosks at Watershed Preserve, Farrel-McWhirter Farm, and Idylwood Beach Park. None are exactly the same. The City is developing a new kiosk standard.

Pet Stations – The City’s current standard is Dogi-pot (http://www.dogipot.com/p_junior.htm). These are not placed at every trail location, but located in areas of high use by pet owners.

Drinking Fountains – The City uses Most Dependable Fountains (<http://www.mostdependable.com/>) including the pedestal model (MDF410) and wall mount fountains, and sometimes the City orders the fountain with a pet attachment.



Example of a trail sign

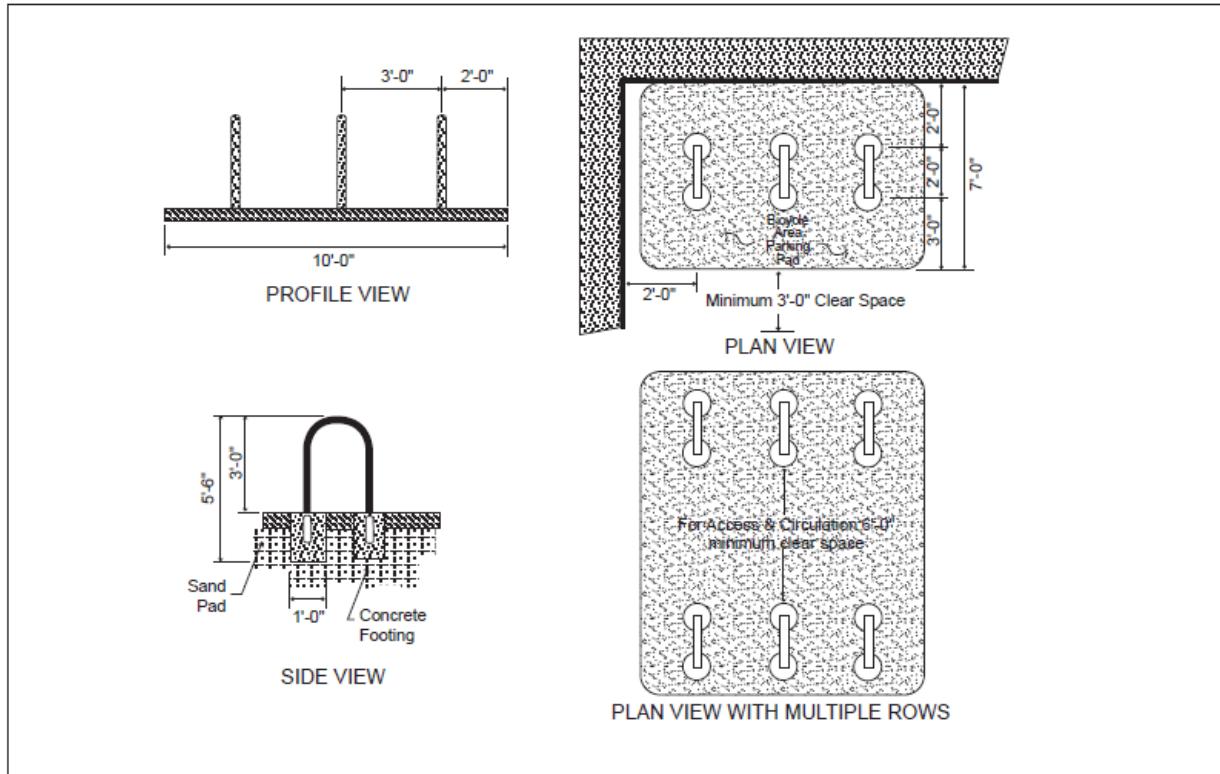


Example of a bench

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Bicycle Racks – The City of Redmond 2009 *Bicycle Facility Design Manual* provides guidelines for bicycle racks. Racks should be cast in concrete or bolted to concrete for security.

Exhibit 8A-3: Bicycle Rack Placement Guidelines



8A.3 Design Alternatives

The following sections provide design standards for each trail type. For all trail types, there will be cases where deviations may be necessary. For example, adequate land may not be available, elevated structures may be required, or new materials may be introduced to surface the trails. Variances from the design standards must be approved by the technical review committee.

Each trail is described with the following features:

- **Vegetation clear zone** – the area where vegetation should be clear above and to the side of the trail. The vertical clear zone may range up to 12 feet high, and the distance from the edge of the trail is specified in the following exhibits.
- **Shoulder** – typically a soft surface or gravel shoulder that serves as a safe zone for trail users to move to the right when being passed, for dogs to walk, and as a transition zone if traveling off the trail
- **Trail** – the main traveling path

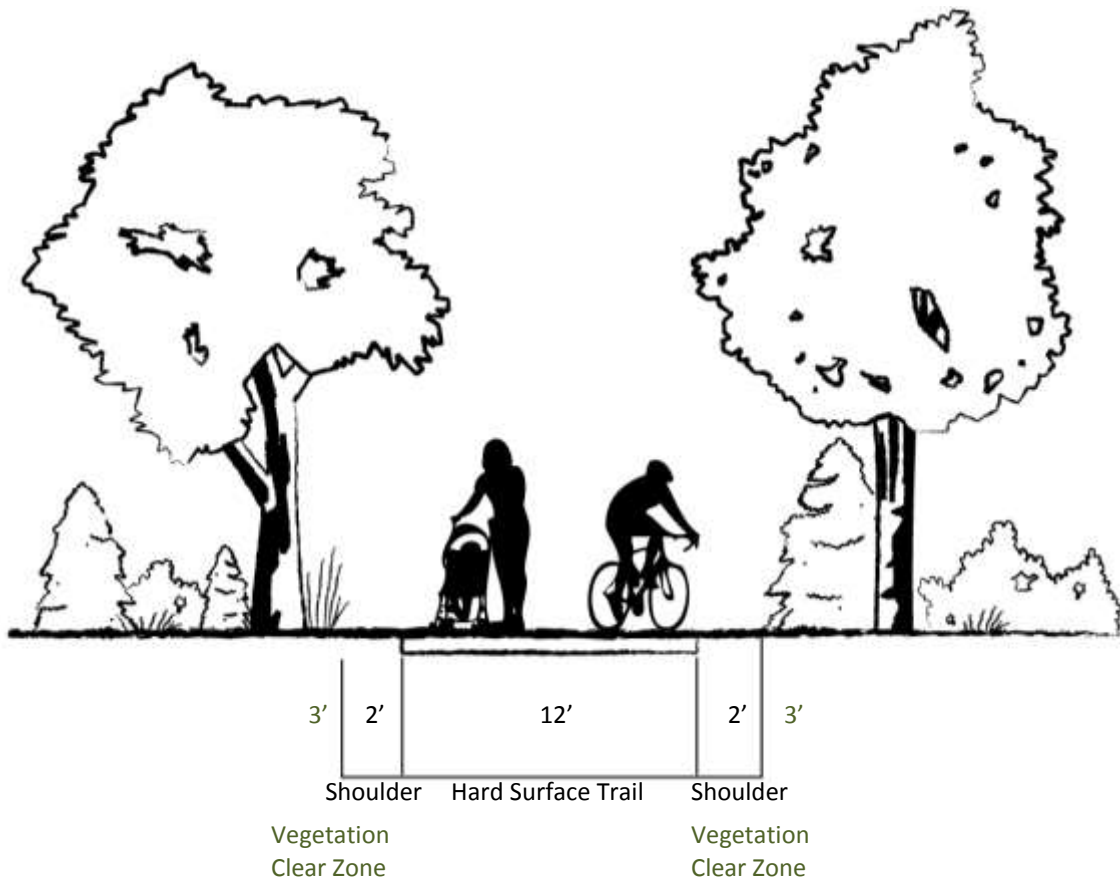
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8A.3.1 Regional Trails

Regional trails will typically pass through the city and connect to other trails and jurisdictions. Regional trails are also typically separated from roads. Regional trails should meet accessibility requirements as described in the most recent version of the American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities.

Hard Surface Regional Trail

A hard surface regional trail will follow these city standards, including a 12 foot vertical clearance for vegetation and structures. This version of the trail layout is 22 feet wide total.



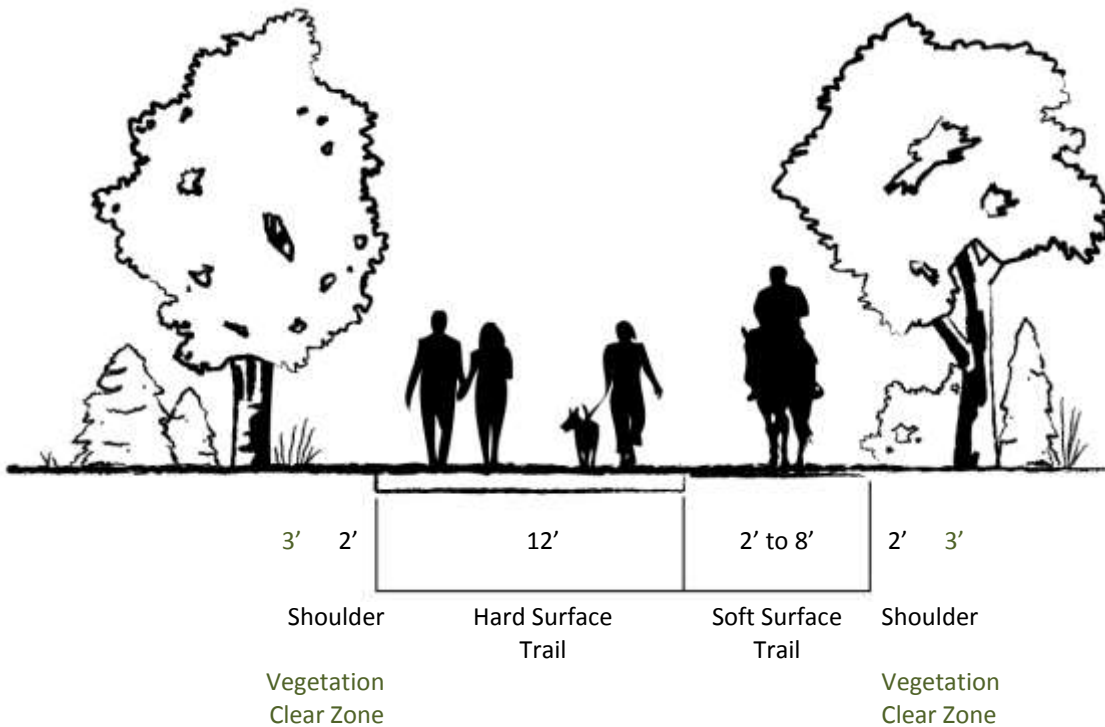
The design of the trail bed and materials will follow the most current version of the AASHTO Standards for design of shared use paths.² These trails are typically eligible for transportation funding, as they are considered a transportation facility (for bicyclists). These trails would preferably have an adjacent or parallel soft surface trail. The following exhibits show various layout alternatives for the hard surface.

² 1999, AASHTO. Guide for the Development of Bicycle Facilities. (Use most current version available).

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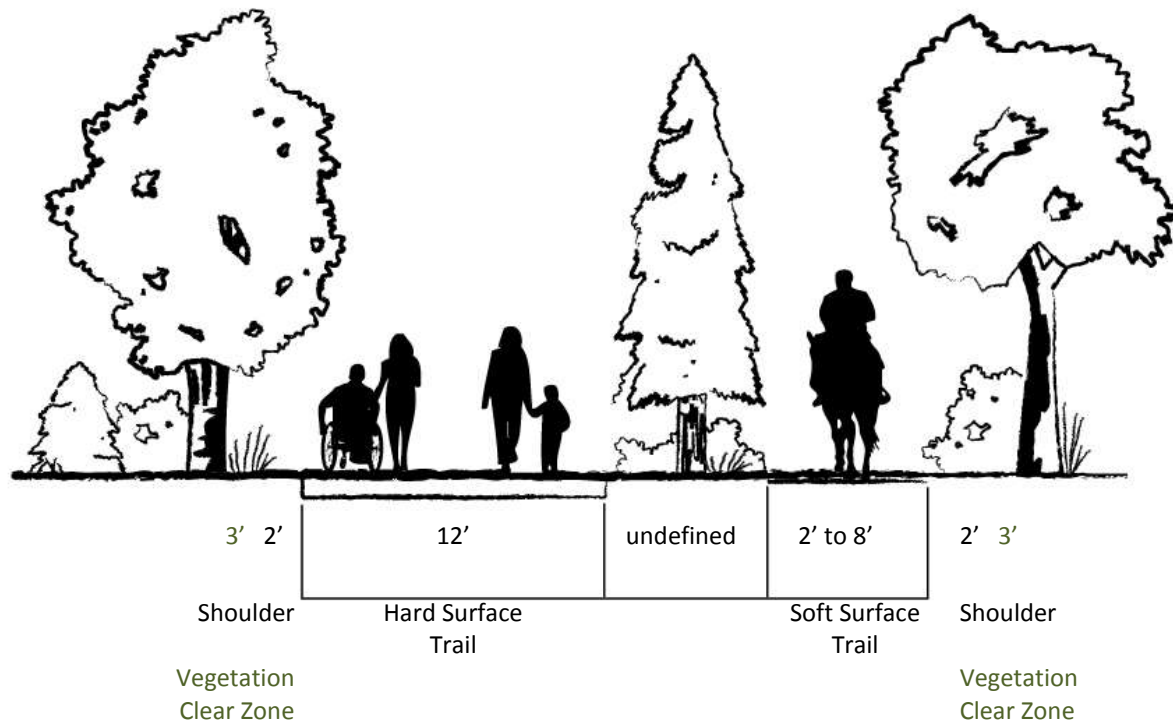
Hard Surface Regional Trail with parallel Soft Surface Trail

If soft surface and hard surface trails are adjacent the cross section would be as follows. This version of the trail layout can vary from 24 feet to 30 feet wide total. The soft surface trail might parallel the hard surface trail with varied separation distance, as needed. If heavy equestrian use is anticipated, a four foot separation is recommended.



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If the soft and hard surface trails are separated due to grade or physical barriers, the cross section would be as follows. This version of the trail layout can vary, but at a minimum it would be 24 feet plus the undefined area.

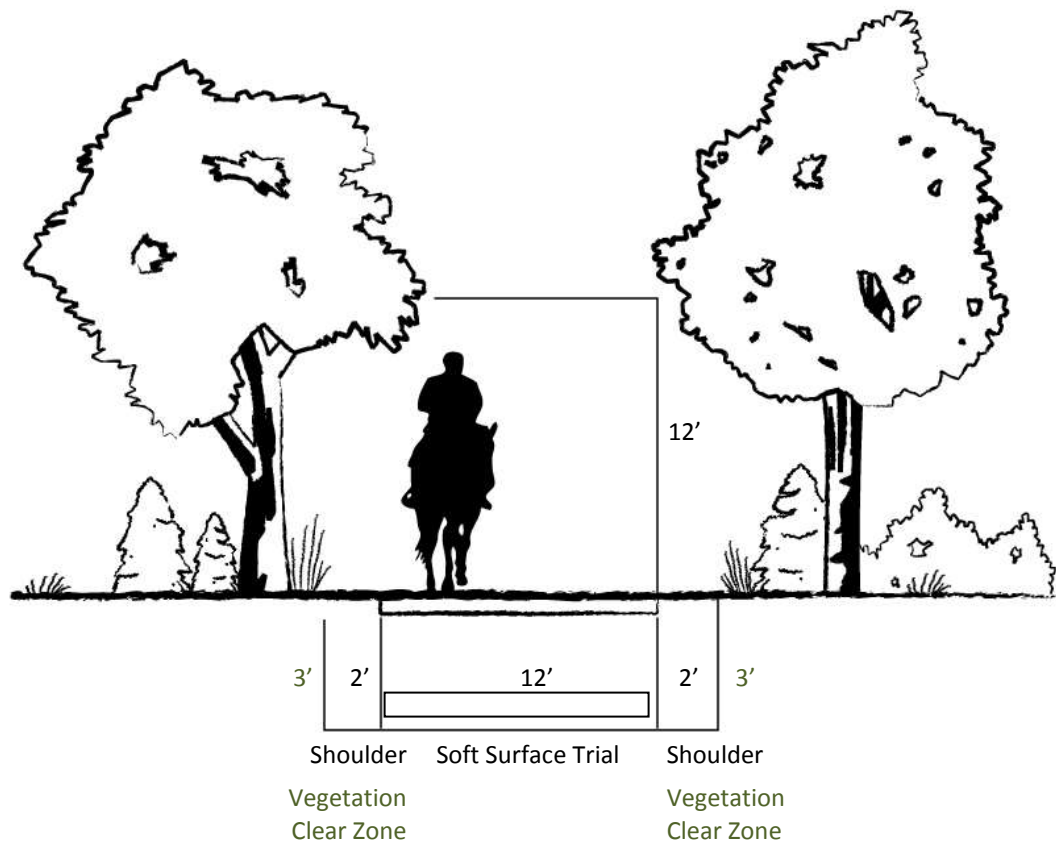


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Soft Surface Regional Trail

Many times soft surface regional trails are developed due to demand for soft surface trails or while awaiting funding opportunities to pave them. Soft surface regional trails, like their paved counterparts, will typically span a good portion of the city and potentially connect to other trails leading to other jurisdictions.

A soft surface regional trail will follow these city standards, including a **12 foot vertical clearance** for vegetation and structures. This version of the trail layout is 22 feet wide total.



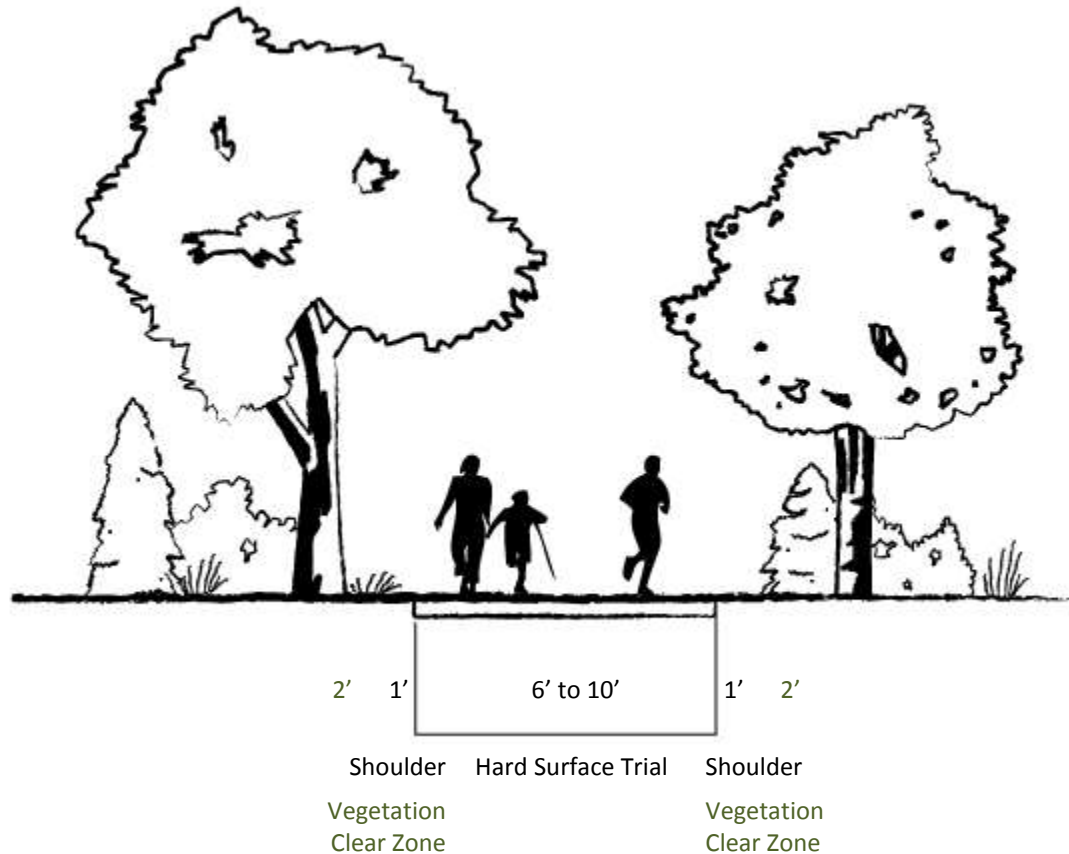
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8A.3.2 Connector Trails

Connector trails are the key linkages between regional trails and other key areas. These trails can be paved or soft surface trails, but are generally narrower than regional trails due to more limited use and possible land access issues. These trails can range from six feet wide to ten feet wide to follow City sidewalk standards. Five feet may be allowed if a variance is granted. All variations would have a standard one-foot shoulder minimum. Connector trails should meet accessibility requirements as described in the most recent version of the American Association of State Highway and Transportation Officials (AASHTO) Guide.

Hard Surface Connector Trail

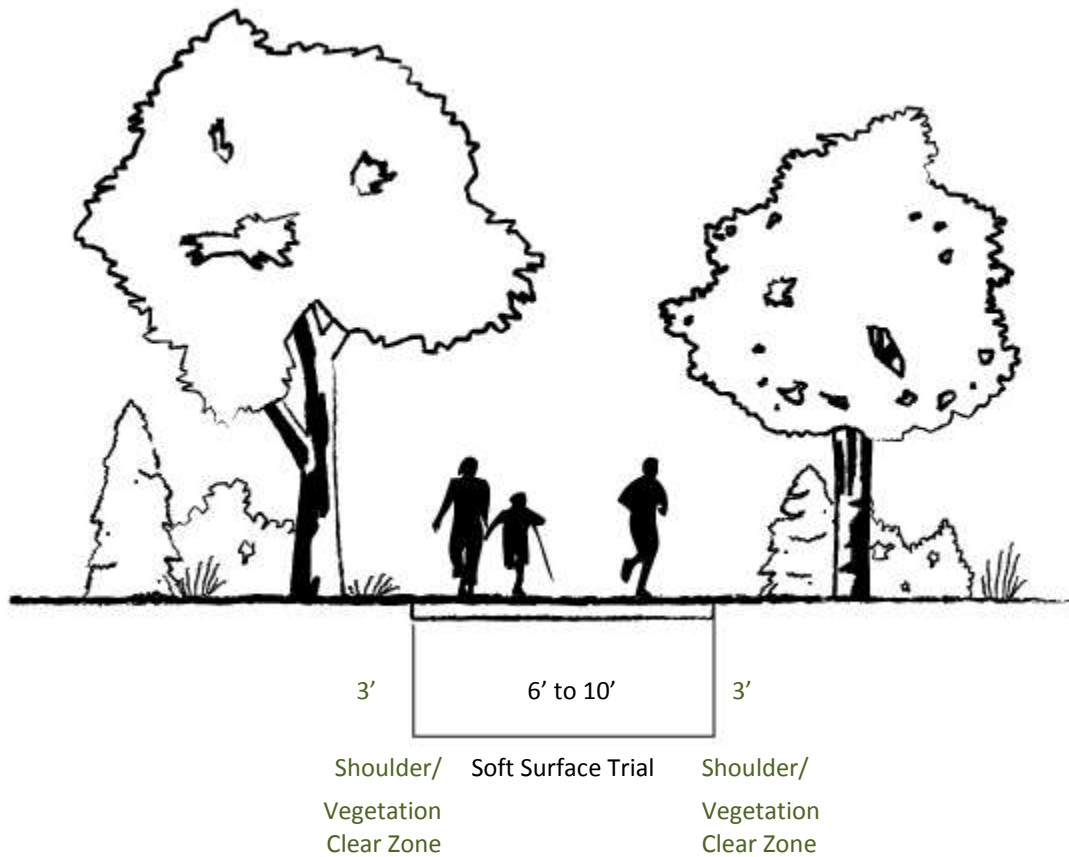
A hard surface connector trail will follow these city standards, including a **12 foot vertical** clearance for vegetation and structures. This version of the trail layout can vary from 12 feet to 16 feet wide total.



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Soft Surface Connector Trail

A soft surface connector trail will follow these city standards, including a **12 foot vertical** clearance for vegetation and structures. This version of the trail layout can vary from 12 feet to 16 feet wide total.



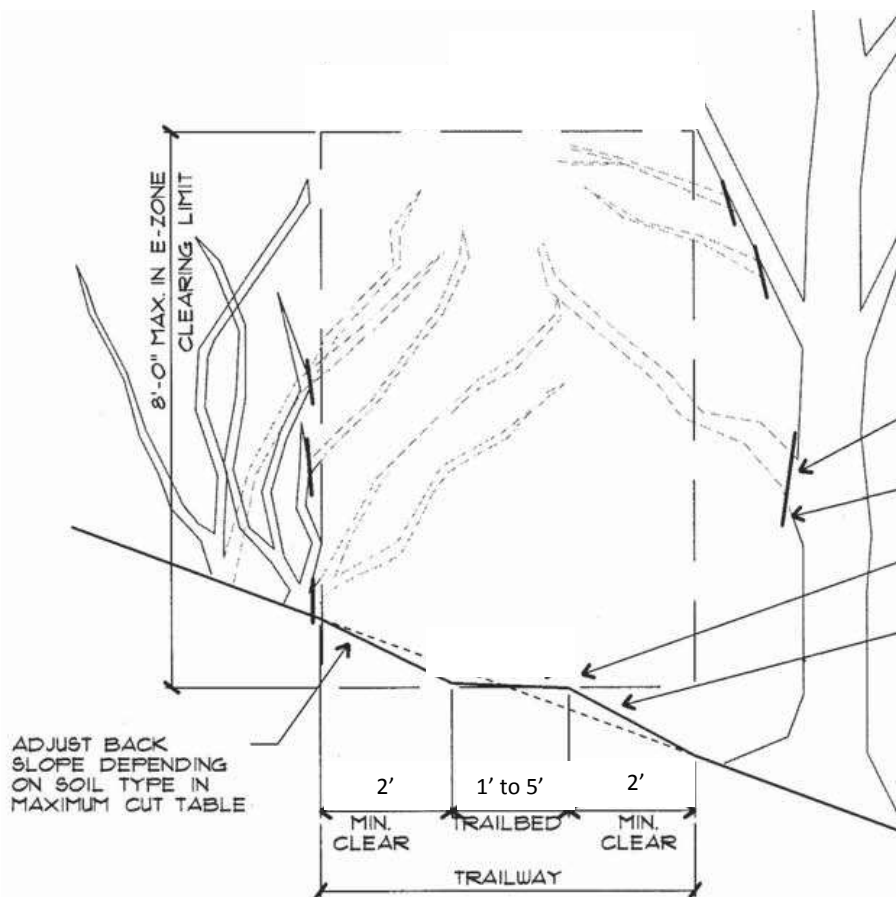
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8A.3 Local Trails

These trails will most often be soft surface trails. Local trails can range from two feet to six feet wide. Narrower widths may be allowed for single-track trails. These trails are often built through wooded areas in a more natural environment for hikers, equestrians, and mountain bikers. The trails can also be used as neighborhood link trails or park trails.

Local trails will typically be constructed with the native soil from the site, hog fuel or crushed rock. Vegetation will be cleared and the trail will be graded slightly to reduce off-camber trail conditions. Some local trails may require reinforcement with gravel, pavers, bridges, or water diverting measures such as water bars in wet or eroding areas. The recommended design guidelines for local trails are provided in the most recent version of the International Mountain Bike Association's Guide to Building Sweet Singletrack. This resource is used by hiking and other trail advocacy organizations around the country for designing trails for hikers, equestrians, as well as mountain bikers.

Local trails will follow these city standards, including an **8 foot vertical clearance** for vegetation and structures. This version of the trail layout can vary from five feet to ten feet wide total. This is based on two foot-wide shoulders and a one to five foot-wide trail surface.



Adapted from the City of Portland, OR Trail Design Guidelines

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Blue Trails

Most of the water access points within the City are on King County property, adjacent to the Sammamish River, except for Idylwood Beach Park. The following guidelines apply to the City of Redmond. When designing a boat put-in on King County property, the City would defer to the County's standards. Key design standards for blue trails should include:

- Provide access points at fairly frequent intervals (5 miles or less for rivers).
- Provide adequate parking to meet demand. Hand carry launches and boat ramps should be constructed of hard surfaced materials. Boat slides may be allowed where banks are steep.
- Have information kiosks and brochures at each access point that orients users to the trail, and contains a map describing public use areas, sanitation stations, emergency telephone numbers and locations of telephones, camp sites, rules and regulations.
- A "leave no trace" philosophy of use should be advocated in the literature and on information kiosks.
- Riparian areas should be protected and maintained as functioning buffers.
- Public lands should be clearly identified from the route.
- Mile markers should be posted along the route and tied to the map in the brochure.
- Prohibitions against trespass on private land should be clearly stated in informational literature.
- Provide sanitation facilities at public access points and periodically along trail (5 miles suggested minimum).
- A path from the water to adjacent land area should follow connector trail standards and be accessible. The path at the water's edge should widen to 12 feet near the water's edge to provide adequate access and maneuverability.

Path to Canoe/Kayak Launch



Left - Path leading from parking area to launch point at Luke McRedmond Landing on the Sammamish River



Right – Launch area at the NE 90th Street Bridge off the Sammamish River Trail